

DEC 7 1937

AGRICULTURAL NEWS LETTER

VOL. 5 - NO. 12

DECEMBER, 1937

This publication gives information on new developments of interest to agriculture on laboratory and field investigations of the du Pont Company and its subsidiary companies.

In addition to reporting results of the investigations of the Company and its subsidiaries, published reports and direct contributions of investigators of agricultural experiment stations and other institutions are given dealing with the Company's products and other subjects of agricultural interest.



ISSUED BY PUBLICITY DEPARTMENT, E. I. DU PONT DE NEMOURS & CO., INC., WILMINGTON, DEL.

AGRICULTURAL NEWS LETTER

Vol. 5 - No. 12

December, 1937.

This issue contains:

	Page
Du Pont Announces a New Fertilizer Compound Containing Forty-two per cent Urea Nitrogen.....	201
Important Diseases of Wheat and Their Control Discussed in Bulletin of Ohio State University	203
Standardization of Fertilizers Sought in Canada Through Provincial Fertilizer Boards or Councils.....	206
National Forest Wildlife Ranges Contribute to the Preservation of a National Resource	208
Users of Tar Sprays Protected from Injury to Face by Use of Mask made of "Cellophane" Cellulose Film.....	210
Disposal Capacity of Septic Tanks and Pools Increased by Blasting the Subsoil to Insure Greater Absorption.....	211

#####

DU PONT ANNOUNCES A NEW FERTILIZER COMPOUND
CONTAINING FORTY-TWO PER CENT UREA NITROGEN

EDITOR'S NOTE:- The significance of this announcement will be recognized by agronomists, fertilizer manufacturers and users of fertilizers. Further information may be obtained by addressing a request to the editor.

The Ammonia Department of E. I. du Pont de Nemours & Company, Inc., has developed a new semi-granular fertilizer compound containing 42 per cent urea nitrogen. This material is now in production at a du Pont plant located at Belle, West Virginia. It is available under the trade-mark "Agramon."

"Agramon" has a distinctive dark color, imparted by conditioning agents with which the particles are coated. These conditioning agents also contribute to the free flowing characteristics of the compound.

The product has an equivalent acidity of thirty-six pounds of calcium carbonate per unit of nitrogen or 75.6 pounds of calcium carbonate per 100 pounds.

Use in Complete Fertilizers

When "Agramon" is used in mixed fertilizers the superphosphate should be thoroughly neutralized by ammoniation or by the use of dolomitic limestone, or other alkaline materials. In general, up to 100 pounds of "Agramon" may be used safely in the average mixture in the absence of hygroscopic salts. If hygroscopic materials are included in the fertilizer, the quantity of "Agramon" should be reduced. The amount that can be used will depend on the quantity and kind of hygroscopic materials in the mixture.

The use of "Agramon" is especially advantageous in the formulation of high nitrogen grades and double strength mixtures. Its low equivalent acidity combined with high nitrogen content provides a convenient means of reducing potential acidity. The formulation of these grades is made easier through the use of the compound.

Use in Top Dressers -- Direct Use

Among the advantages offered by "Agramon" is that it may be mixed with dolomitic limestone or other inert materials in any proportion to produce non-caking top dressers of any desired nitrogen concentration. It may also be used as a source of nitrogen in special top dressing mixtures containing potash and phosphoric acid. As with mixed fertilizers, the acid phosphate must be well neutralized and combination of "Agramon" with hygroscopic salts should be avoided. One of the important uses for "Agramon" is direct application in orchards and citrus groves. Its high analysis brings handling costs down to a minimum. Residual salts, the effect of which is known to be harmful, are completely absent in "Agramon."

Continued on next page

"Agramon" will produce the same high quality and yield in the field that are obtained when urea is used. It provides fertilizer with "efficient nitrogen," i.e., nitrogen that is (1) completely available, (2) resistant to leaching, and (3) low in equivalent acidity. It is classed in many states as water soluble organic nitrogen.

"Agramon" is a trade-mark of
E. I. du Pont de Nemours & Co., Inc.

IMPORTANT DISEASES OF WHEAT AND THEIR CONTROL
DISCUSSED IN BULLETIN OF OHIO STATE UNIVERSITY

EDITOR'S NOTE:- The information presented here is taken from Bulletin No. 81, Ohio State University Agricultural College Extension Service. The title of this bulletin is "Wheat Growing in Ohio." It was prepared by Mr. Earl Jones, Department of Agronomy.

Stinking Smut.- The loss caused by stinking smut usually exceeds that caused by any other wheat disease in Ohio. During the years 1931 to 1935, inclusive, estimated losses due to stinking smut have varied from 1.5 to 2 per cent. When expressed as bushels this represents a reduction in yield ranging from 517,000 to 818,000 bushels for Ohio alone. Generally the loss for any one year exceeds a half-million bushels. Stinking smut destroys practically all the grains in the infected heads, and also reduces the market value of the entire crop because of the peculiar odor of the smut balls and spores.

When smutted wheat is planted the spores germinate and grow along with the grain, infecting the wheat plant in the seedling stage. The fungus continues to develop in the wheat plant without showing any marked indication of its presence until heading time, when usually the entire head of wheat becomes invaded with the fungus, with smut balls developing instead of grains of wheat.

Smutted heads are easily detected before ripening. They stand erect and are blue-green in contrast to the yellowish-green cast of the healthy heads. At harvest time the chaffy parts of infested heads are spread out more than in healthy ones, and the kernels are shorter, plumper, and darker in color than the healthy grain.

Control.- Stinking smut can be controlled by first cleaning the seed with a fanning mill and then treating it with New Improved "Ceresan" dust in a closed container. Every kernel must be thoroughly coated with the dust. Place 1 bushel of wheat in the mixer, scatter over it 1/2 ounce of New Improved "Ceresan," and turn the mixer about 40 times at the rate of 30 revolutions per minute. All treating should be done in the open or in a well ventilated building. The operator should wear a respirator or a dry cloth tied over the nose and mouth to prevent severe irritation from the "Ceresan" dust.

After the grain has been treated it may be sown the following day or kept for a month without injury. Treated wheat is poisonous to livestock and should not be fed or sold, except for seeding purposes.

Loose Smut.- Loose smut may be easily identified in the field at heading time by the black spore masses which replace the wheat heads, and at harvest time by the naked stalk tips. The chaff and kernels are usually both destroyed by the smut fungus.

Continued on next page

Control.- Since the fungus which causes loose smut is contained within the seed coat of the wheat, "Ceresan" will not control this disease. The hot water method, which requires accurate temperatures and equipment not available to the average grower, must be used. Instructions will be sent on request to your county agent or the College of Agriculture.

Resistant varieties offer the most permanent control for loose smut, Trumbull wheat is practically immune from this disease, and Fulhio shows a high degree of resistance.

Wheat Scab.- Grain growers will remember that in 1928 and 1929 there were severe scab epidemics in parts of Ohio. The wheat scab fungus also causes scab of barley, oats, and rye, and a root and ear rot of corn.

Wheat scab can be identified in the field by the appearance of white heads or part of heads shortly after blossoming when the rest of the heads are still green. No kernels or only badly shriveled ones are produced in the affected parts. In addition to blasted heads, this fungus also causes a seedling blight of wheat which can be largely eliminated if plump clean wheat is sown. However, blasting of the heads cannot be entirely controlled by sowing clean seed, because the spores of the fungus blow from old corn stubble and refuse left in the field from the previous corn crop. In portions of Ohio where wheat is sown in corn stubble, more scab occurs than in other portions of the state. Fifty per cent infected heads have been found where wheat followed corn, while in the same field, where oats preceded wheat, only 8 per cent of the heads were affected.

Control.- The ultimate control of this disease lies in the development of resistant varieties. No varieties are known at the present time which are immune and also suitable for Ohio conditions. However, Trumbull and Fulhio are fairly resistant.

Stem Rust.- Stem rust is a serious factor in wheat production throughout the northwest, and in Ohio it causes loss to individual growers during some seasons. Formerly it was quite prevalent in Ohio. The common barberry is the alternate host of this rust fungus. The spores which infect the wheat in the spring are blown from common barberry bushes in the vicinity. On these infected wheat plants many spores are quickly produced which in turn blow to other wheat plants, and soon the entire field develops stem rust. The red pustules occur mainly on the stems and leaf sheaths, are larger than those of leaf rust, much longer than broad, and contain a brownish-red powder. When the epidermis breaks, conspicuous fragments of it cling about the pustules. This is the red rust stage.

About harvest time, the pustules become black and appear as raised, elongated spots on the surface of the wheat plant. This is the black rust stage.

Control.- If the common barberry is completely eradicated, severe epidemics of stem rust will probably disappear. Some stem rust will probably continue to occur due to spores blown in from the South. Growers who have severe rust

Continued on next page

epidemics or who know of common barberry bushes in their vicinity, should communicate this fact to their county extension agent, or to the extension specialist in plant pathology. The office of barberry eradication will be notified and an attempt will be made to eliminate such barberry bushes.

While resistant varieties have been developed in some sections of the country, they are seldom useful in other sections, because there are many different strains of the rust fungus.

Leaf Rust.- In addition to stem rust, wheat is also attacked by a leaf rust, often with considerable losses. The leaf rust fungus does not attack the barberry; and this shrub has nothing to do with the spread of leaf rust.

In leaf rust the red spore pustules are mainly on the leaf blades and to a lesser extent on the leaf sheaths and stems. They are about the size of a pin head, round or oval in shape, and yellowish or orange-brown in color. The wheat epidermis is not conspicuously ruptured, as in stem rust. The black spore pustules are small and flat and do not rupture the epidermis.

We have no practical control measures to suggest for leaf rust. Farmers should be able to distinguish between the two types of rust so that they will know whether or not to look for barberry bushes when epidemics occur.

"Ceresan" is a trade name registered in the United States Patent Office by the Bayer-Semesan Company, Wilmington, Del.

STANDARDIZATION OF FERTILIZERS SOUGHT IN CANADA THROUGH PROVINCIAL FERTILIZER BOARDS OR COUNCILS

EDITOR'S NOTE:- Farmers and fertilizer manufacturers alike will benefit greatly with the spread of the movement in the United States and Canada to standardize fertilizers both to better meet the requirements for plant food according to locality and to reduce the number of formulas offered. This article, dealing with the progress being made in Canada, will be of interest to agronomists and others in "the States."

By B. Leslie Emslie,
Canadian Industries Limited,
Montreal, Quebec, Canada.

There exist in Canada several provincial fertilizer boards or councils on which are represented the department of agriculture, the farmer and the fertilizer manufacturer, and they meet annually for the purpose of discussing educational policies, to examine results obtained from experiments carried out during the year and to make recommendations based on the evidence available. Thus, consistently with the advance in knowledge of the subject, improvements in methods and practice are made. The Province of Quebec was the first to establish a fertilizer board, and one of its earliest enactments was the reduction of the number of brands or analyses on the market. There was need for this, and there is still room for improvement not so much in Quebec, where the number of brands receiving official sanction is sufficiently limited, but more in Ontario. That the latter province should be burdened with so many brands is due partly to the greater diversity of crops grown there. Besides the Ontario Fertilizer Board, there is also the Standing Committee on Tobacco Fertilizers, headed by Dr. N.T. Nelson, Chief of the Tobacco Division, Ottawa, which exercises some measure of authority in that special field.

Simplification Making Progress

The multiplicity of brands on the market proved most confusing to the farmer, and many of these were so similar in analysis that it was a toss-up as to which of several would give the best performance in the field. An obstacle to the standardizing of analyses throughout the Dominion is the local popular prejudice in favour of certain long established brands. In British Columbia, for instance, a 3-10-8 is one of the most widely used, yet is not represented in any other province. Similarly in the Maritimes there are 4-8-7, 5-9-8, 4-8-13 and 5-8-12 analyses which are confined strictly to that territory. A 4-8-4 used to be the big seller in Nova Scotia but is now superseded by 5-10-5 containing the same proportions of plant food substances but in more concentrated form. This commendable trend toward higher analyses, without sacrificing any virtue, is noted also in the substitution of 5-9-8 for the 4-8-7, and the higher grade costs

Continued on next page

less per unit. The Maritime Fertilizer Council, two years ago, showed enterprise and sound judgment in adopting the 2-12-6, so popular in Quebec and Ontario, while the Boards of these two provinces have given greater prominence of late to 2-16-6 and 0-16-6, the latter a very popular fertilizer for fall application to pasture and hay lands.

Members of the Eastern Canada Fertilizer Association met in Toronto, recently and struck from the list no less than 14 brands which were justly considered superfluous. Among those deleted was the 2-8-4, the lowest grade permissible under the provisions of the Fertilizers Act, which specifies a minimum of 14 total units and may soon raise it to 16. Under the able administration of G. S. Peart, the Fertilizers Act performs a most useful service to both farmer and manufacturer.

NATIONAL FOREST WILDLIFE RANGES CONTRIBUTE
TO THE PRESERVATION OF A NATIONAL RESOURCE

EDITOR'S NOTE:- While it is a gratifying fact that considerable progress is being made in the restoration of various of the larger forms of wildlife the problem of restoring the small useful forms has not yet been solved. What can and will be done to increase the numbers of small game animals, upland game birds and fur bearers is largely in the hands of those connected in one or another way with agriculture. The article below presents interesting information on the situation as it relates to so-called big game and fur-bearing animals.

By F. A. Silcox, Chief,
United States Forest Service,
Washington, D. C.

The National Forests today have a total area as large as all of the New England and Central Atlantic States put together. When it is remembered that a prime mover in the development of this great federal forest system was none other than Theodore Roosevelt, it seems logical to believe that in his mind the establishment of such areas would ultimately mean a great deal in the protection and stabilization of America's wildlife resources.

The National Forests, totalling some 170 million acres, are located in 37 states, Alaska and Puerto Rico, and include portions of every major mountain system and of every forest region of the country. Along the Appalachians of the East, National Forests stretch from New Hampshire to Georgia, and extend southward into the pinelands of Florida and westward into Texas and Arkansas. National Forest lands fringe the Great Lakes, and dot the head-waters of the Mississippi. In the West, the National Forests cover considerable areas in the Rocky Mountains from Canada to Mexico, and in the Cascades, Sierra and Coast Range Mountains from north to south. The system extends into Alaska, with some 21 million acres along the rugged North Pacific coastline.

The National Forest system was created to conserve forests that protect important watersheds, to preserve potential sources of timber supplies, and to provide and maintain other forest values and services in the public interest. Two of these other services have become increasingly important in recent years, the provision of opportunities for outdoor recreation, and the safeguarding of America's remaining wildlife populations.

The importance of wildlife to two large groups of American citizens -- those living in and near the forest areas who draw their livelihood from the many pursuits centered about wildlife, and the vast number of folks who visit the National Forests for hunting and fishing and other forms of recreation -- has

Continued on next page

become more evident every year. The U. S. Forest Service, which administers the National Forests, has recognized these trends, and long ago included wildlife management in its list of major duties.

Civilization's Advance and Wildlife

Perhaps the greatest single reason for the importance of the National Forests to the welfare of wildlife is this; the extension of cities, towns, ranches, farms, orchards -- all of the establishments of modern civilization -- has removed vast areas which formerly supported great wildlife populations which once existed in America. Wildlife has retreated farther and farther back into the foothills and mountains as civilization has expanded. Only in such areas as the National Forests do natural conditions on a large enough scale still exist to sustain certain forms of wildlife. Since no one wants to -- or even could if he so desired -- return to conditions which existed a century ago, the problem of American wildlife conservation and stabilization today must be handled according to existing environment conditions.

The National Forests are at present able to harbor during the summer period about three-fourths of the deer, elk, bear, mountain sheep and mountain goats ranging in the Western States. National Forests and recently established purchase areas east of the Mississippi, while smaller than those in the West, are also important as the yearlong homes of different species. According to current estimates, there is a total of more than a million and a half big game animals and nearly that number of fur bearers in the National Forests. Incidentally, this represents an increase in numbers of about 125 per cent since 1924 -- which I believe speaks well for the part the Forest Service plays in game management.

Winter Range a Problem

The present numbers of game on the summer ranges of the National Forests as a whole do not by any means represent the limit of possibility of increase in these populations. One factor severely limiting the carrying capacity of a great many areas is winter range. Only about 40 per cent of the big game winter ranges are, on an average, within the National Forests. This seriously restricts any increase under present conditions in those areas of the wildlife populations which must be considered in relation to yearlong requirements.

The keynote of National Forest Administration is what foresters call "sustained yield." This means management of forest resources for continuous production and use. Under sustained yield, timber, for example, is harvested in such a way that future timber crops can be produced on the same area. Sustained yield is applicable not only to timber but to other organic and renewable resources of the forest. To a considerable extent, the principle is also applicable to wildlife.

Thus, in its game management work in the National Forests, the U. S. Forest Service seeks an optimum development of the wildlife resource, in careful coordination with all other values and uses of the forests, and to maintain the wildlife resource permanently on that basis.

USERS OF TAR SPRAYS PROTECTED FROM INJURY TO FACE
BY USE OF MASK MADE OF "CELLOPHANE" CELLULOSE FILM

EDITOR'S NOTE:-This valuable suggestion on protecting sprayers against the caustic effect of tar sprays on the skin is from Bulletin 606, titled "Control of the Mealy Plum Aphid," issued by the University of California Agricultural Experiment Station, Berkeley, California. Dr. Leslie M. Smith is the author of the bulletin.

Tar sprays are caustic to the skin of men and horses, and precautions must be taken to avoid injury. The causticity varies with conditions and individuals. In general, blondes are more susceptible to injury than brunettes, and hence, brunettes should comprise the spray crew whenever possible. Again, tar sprays produce a severer irritation in sunlight than in shade, and hence night spraying or spraying on overcast days will avoid some injury. Sprayers should protect all parts of their bodies from the spray. Spray coats, gloves, and hats should be worn, and the face should be protected with a sheet of Moisture-proof "Cellophane" wedged under the hat band. As the spray covers the "Cellophane" and clouds the vision, additional clear space can be pulled out of the hat. Usually a fresh piece of "Cellophane" will be needed for each tank of material. Attempts to protect the face with creams and greases have, in the case of the writer, proved unsuccessful. Some sprayers, however, claim that protection is obtained by the use of such materials.

There is a tendency among sprayers to discard protective clothing and masks on the basis that they hamper their vision and action, or that such protection is unmanly. This is a serious mistake. The possible injury from tar sprays should not be taken lightly. The writer has seen several men severely burned, and one required hospitalization. As has been stated earlier, men vary in their susceptibility to tar injury. The fact that one man experiences no difficulty is no clue to the susceptibility of his co-workers. Each man should determine to his own satisfaction whether or not he is susceptible. It should be borne in mind that the burning sensation does not arise immediately after an application of tar to the skin, but rather will reach a maximum from 2 to 4 hours later.

"Cellophane" is a trade-mark of
E. I. du Pont de Nemours & Co., Inc.

DISPOSAL CAPACITY OF SEPTIC TANKS AND POOLS INCREASED
BY BLASTING THE SUBSOIL TO INSURE GREATER ABSORPTION

EDITOR'S NOTE:- The development of methods for increasing the capacity of sewage disposal facilities on the farm is of no little importance to agricultural engineers and others interested in rural sanitation. Because results may be achieved by simple blasting operations it seems likely that considerable work of the kinds described here will be done.

By L. F. Livingston, Manager,
Agricultural Extension Section,
E. I. du Pont de Nemours & Co.,
Wilmington, Delaware.

Growing realization of the importance of farm sanitation as a result of educational efforts carried on by various agencies is evident in different sections of the country. This has resulted in a steadily increasing number of requests for the advice of agricultural engineers on the subject of household sewage disposal. Not only is there an increase in the numbers of septic tanks supplied by manufacturers, but many farmers are constructing their own tanks according to specifications provided by agricultural experiment stations.

Further interest in sanitation is shown by the attention being given to maintaining or restoring the efficiency of septic tanks which have been in use for a period of years. Cesspools, likewise, are receiving attention, either to make them more sanitary or to renew their disposal efficiency.

As is well understood, the efficient operation of a tank or a pool depends primarily on the absorption of liquid by the soil. Where the soil is sandy, little difficulty is experienced in disposing of fluid. Stiff clay soil, however, frequently makes disposal more or less of a problem, due to the low absorbent property of this type of soil.

Subsoil Blasting Found Useful

Explosives have been used to advantage in better adapting soil to the absorption of liquid from septic tanks through subsoil blasting. The procedure is simple and involves little labor or cost.

But, it is to be noted, that in addition to blasting the subsoil there should be followed the usual practice of laying the drain tile line in gravel, cinders or crushed stone.

Continued on next page

Before laying the tile, small charges of dynamite are exploded at a depth of about six feet below the level of the tile line. One-stick charges are used, spaced eight feet apart. The blasts shatter the subsoil and make it more porous.

Since the distance between the holes is too great to permit shooting the charges by propagation, each stick of dynamite must be primed. Either a blasting cap and fuse or an electric blasting cap may be used. The electric method is to be preferred because of its greater safety.

Septic tanks which have been in use for a long time and have shown a decrease in capacity have been restored to efficient operation through subsoil blasting.

In doing this work, holes are put down at intervals of eight feet and to a depth of several feet below the level of the tile line, but at a distance of six to eight feet from the tile line and on both sides of it. Each hole is loaded with a single stick of dynamite. The purpose is, of course, to loosen the subsoil to permit greater absorption of liquid.

Improving Cesspools by Blasting

Subsoil blasting has been shown to largely increase the drainage of cesspools. After a pool has been dug and lined with brick or stone, single sticks of dynamite are loaded in holes in a circle eight to ten feet from the edge and three to four feet below the level of the bottom of the pool. The charges should be spaced about eight feet apart. Each stick of dynamite is primed with a blasting cap and fuse or with an electric blasting cap. Pools have in many cases shown double the usual drainage capacity after the subsoil has been blasted.

A pool which has been in use for some time is likely to lose capacity. This is particularly the case where a soil of the gravel type contains more or less clay. A way this has been remedied is by emptying pools and blasting the subsoil.

For the purpose a single charge of one or two sticks of 40 per cent Red Cross Extra dynamite, or a similar explosive, is loaded in a single hole in center and four or more feet below the bottom of the pool. An electric blasting cap should be used to detonate the charge. It is important in all blasting, whether in connection with septic tanks or cesspools, to tamp the holes with earth after loading unless they are filled with water. Also, fuses or leading wires from electric blasting machines must be long enough to permit blasters and others to take a safe distance before blasts. This precaution should be taken even though a single-stick charge of dynamite is hardly likely to disturb the surface of the ground.

Blasting for the purposes discussed here may be done during the winter months, when farmers have the time, unless the ground is frozen so hard and deep that difficulty would be experienced in making the holes.

#####